

REMARKS

The present amendment is submitted in response to the Office Action dated August 29, 2003, which set a three-month period for response, making this amendment due by November 29, 2003.

Claims 1-11 are pending in this application.

In the Office Action, the drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) because they include reference signs not mentioned in the description, specifically, 32 and 36. The specification was objected to for various informalities. Claims 1-11 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1, 3, and 4 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,558,066 to Zimmer. Claims 1, 2, and 4 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,699,582 to Berge et al. Claims 1, 4, 5, 7, and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2,714,739 to Neufeld. Also noted as relevant references in the Office Action were U.S. Patent No. 3,085,821 to Ryck. U.S. Patent No. 6,227,747 to Remington et al, and U.S. Patent No. 3,962,744 to Bien et al.

The Applicants note with appreciation the indicated allowance of claims 6 and 9-11, if rewritten to include the limitations of the base claim and any intervening claims.

In this amendment, the specification was amended on page 6 to change shoulder 34 to shoulder 32. Reference numeral 36 can be found in the

specification on page 6, line 18, with reference to the fluting. Thus, the objections to the drawings have been obviated.

The specification has been further amended to add appropriate headings, to delete reference to the claims, and to amend the abstract to a single paragraph.

Claims 1-11 have been amended substantially to address the rejections under Section 112, second paragraph, by providing proper antecedent basis for the objected-to terms.

With regard to the rejection of claim 1 on grounds that it is unclear as to what materials are included in the limitations "light metal", the Applicants respectfully submit that the term "light metal" is a term of art in the relevant technology, generally referring to metals such as aluminum or a metal with similar qualities as aluminum. The "harder metal" is therefore one that is harder than these light metals, selected from the group consisting of steel, bronze, or copper, as defined in claim 2.

With regard to the substantive rejection of the claims, the Applicants have amended claim 1 to more clearly define the present invention over the cited references to Zimmer, Berge, and Neufeld. Amended claim 1 now is directed to "a drive shaft (10) for a windshield wiper, comprising a crank (12) is fastened to the drive shaft and wherein the drive shaft has a cylindrical screw thread on a free end in a region of a fastening part, wherein the drive shaft includes a base body (14) made from an extruded light metal profile and via connection part (16,

22) made from a harder material, wherein said connection part is fixedly connected with the free end of the base body and includes said screw thread".

The Applicants respectfully submit that amended claim 1 defines a patentably distinct set of features neither shown nor suggested by the cited references.

Specifically, none of the cited references discloses a drive shaft for a windshield wiper, which is made from an extruded light metal profile. The only basis for rejection of the claims is the conclusion that the selection of a suitable material is obvious for the practitioner. The Applicants respectfully disagree.

It is remarkable that until now, no practitioner has arrived at the idea to use this material for a drive shaft for a windshield wiper, although the extrusion method for light metal alloys has been known for decades. The explanation for this is that light metal is not suitable for a drive shaft of a wiper assembly, since it does not possess the requisite strength needed to withstand the demands in the region of the fastening of the wiper arm.

In this regard, it is to be noted that the wiper arm is releasably connected by a screw connection with the wiper shaft. The light metal, based on its minimal hardness, would be quickly worn upon exchanging the wiper arm, whereby the screw connection would be unusable. In addition, by the unfavorable corrosive behavior of the light metal, the screw connection would not be releasable after a time, or would only be releasable with great difficulty. These considerations have prevented the practitioner from making the drive shaft from an extruded light metal profile.

However, the basic principle of the present invention is to make the drive shaft from two materials, namely, from an extruded light metal for the base body and a harder material for a connection piece with the screw threads, thereby solving the problem. The harder material bears up against the loads on the screw connection itself with multiple connections and releases, while the drive shaft, in general, can be made simply and cost-effectively with minimal weight from an extruded light metal profile.

The extrusion process, as well as the light metal alloys suited therefor, is known to the practitioner, so that the multiple possibilities in the application need not be elaborated on in the application in detail. As an attachment hereto in this regard, the Applicants include advertising material from the companies Honsel and Pandolfo Alluminio from the internet.

The Examiner cites Zimmer in support of the rejection of claims 1, 3, and 4 under Section 103. This reference shows a drive shaft 14, which has a polygonal drive profile in the region of a fastening part 10 of a wiper arm, on which a cylindrical screw thread for a nut 24 is connected. The nut 24 presses a pressure piece 18, which has an outer cone 22, against a correspondingly formed inner cone 26 of the fastening part 10, which is braced via a disk 56 on a bearing shoulder 60 of the drive shaft. In this regard, large loads exist in the screw connection between the nut 24 and the drive shaft 14. On this basis, the drive shaft 14 and the nut 24 are made from a hard material, generally, from steel.

The pressure piece 18, which cannot be compared with the connection part 16, 22 of the present invention, likewise can be formed from a hard material, which retains its shape during operation and can be fastened permanently without play. In the embodiment according to Zimmer described in column 6, lines 21 through 34 or according to claim 10, the pressure piece is made from aluminum or an aluminum alloy. Already, it can be determined that it does not have the same function as the connection part 16, 22 of the present invention.

The Applicants respectfully submit that the Examiner has incorrectly interpreted the stepping of the outer cone 22 of Figure 11 in Zimmer as a screw thread. This is not obtainable technically and also is not provided from the description in column 6 (see above). In addition, the stepping represents cylindrical sections, whose diameter minimizes to the lower end in stages. With a stepped outer contour of the pressure piece, in addition to a soft material, the surface pressing between the fastening part and the pressure piece can be increased (see, for example, column 4 lines 12-26).

The Zimmer reference relates neither to the material of the drive shaft 14 nor with the problem of the screw connection between the drive shaft 14 and the nut 24.

As noted above, to more clearly define the present invention over the Zimmer reference, amended claim 1 defines that the drive shaft has a cylindrical screw thread on its free end in the region of a fastening part and that a connection piece made from a harder material is fixedly connected with the base

body. The pressure piece 18 of Zimmer is axially displaceably disposed on the drive shaft and therefore is not fixedly, but releasably connected therewith.

In support of the rejection of claims 1, 2, and 4 under Section 103, the Examiner cites the reference to Berge et al. The Examiner defines the nut 38 (Fig. 4) as a fastening part of the drive shaft 12. This is incorrect. The drive shaft 12, in the common manner, has a profile ("coupling section") 32 and a cylindrical screw thread 28. The reference, however, likewise fails to provide that a base body of the drive shaft 12 is made from an extruded light metal and is fixedly connected with a connection part made from a harder material, which includes a screw thread 34. There would be no motivation or advantage for combining the drive shaft 12 with a screw thread 34 made from an extruded light metal profile and to make the nut 38, for example, from steel.

The above-named problems would not be eliminated, and in particular, the corrosion and wear in the screw connection would not be avoided.

The same is true for the Neufeld patent, which was cited in support of the rejection of claims 1, 4, 5, 7, and 8 under Section 103. With the embodiment of Neufeld according to Fig. 3, a head piece 53 with a screw thread is screwed into an inner thread 36 of the drive shaft, while with the embodiment of Fig. 5, a cap nut 79 is screwed onto the end of the drive shaft 31a with 78. In both cases, the thread associated with the drive shaft is made from the same material as the drive shaft itself. This reference provides no suggestion for resolving the above-stated problem, when the drive shaft is made from a light metal profile.

The cited patent to Ryck shows a pressure piece 54, 56, which comprises an elastomer material, according to claim 2 and a relatively soft, non-iron metal, according to claim 3. The drive shaft 40 shows in Fig. 3 on its free end a cylindrical uptake profile 42 and a cylindrical screw thread 44 connected thereto, on which a screw nut 52 is screwed. The drive shaft inclusive of the uptake toothing and the thread 44, is made from the same material. This reference provides no suggestion that the thread 44 should be a component of a connection part fixedly connected with the base body of the drive shaft, which is made from a harder material than the base body of the drive shaft, made from a light metal.

Figure 2 of the Remington patent is cited to show that the uptake toothing is separate from the base body. There is no support for this conclusion in the entire reference. In addition, also here, the drive shaft 16 is one piece with the serration 14 and the thread connected thereto (not specifically shown) and is made from the same material. They do not differ from common windshield wipers, as can be determined from column 2, lines 20-21. As a whole, this reference fails to provide any suggestion that the drive shaft is made from two different materials.

Finally, the Examiner cites the patent to Bien et al. This reference shows the fastening of a wiper assembly to a vehicle body, whereby a threaded part 21 of the bearing housing 13 is displaced through the opening of a body sheet 7 and is screwed by a nut 95. On the free end of the drive shaft 15, which projects out


of the housing, a cap 17 is fastened. Again, this reference provides no suggestion of the present invention.

For the reasons set forth above, the Applicants respectfully submit that claims 1-5 and 7-8 are also patentable over the cited references. The Applicants further request withdrawal of the rejections under 35 U.S.C. 103 and reconsideration of the claims as herein amended.

In light of the foregoing arguments in support of patentability, the Applicants respectfully submit that this application stands in condition for allowance. Action to this end is courteously solicited.

Should the Examiner have any further comments or suggestions, the undersigned would very much welcome a telephone call in order to discuss appropriate claim language that will place the application into condition for allowance.

Respectfully submitted,



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